

THE GENUS PYRROSIA (POLYPODIACEAE) IN AFRICA.

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Some of the species of the genus *Pyrrosia* have a wide distribution in continental Africa. Consequently, it has been found necessary to review the known species of the genus in the continent in order to establish the taxonomic status of some of the species in Southern Africa. The geographical area considered in this revision includes continental Africa and the islands of Principe and São Thomé. Reference is also made to species of the genus occurring in Madagascar and the Mascarene Islands.

Copeland (1947) has been followed in upholding the name *Pyrrosia* in view of taxonomic convenience and general usage of the name. *Candollea* Mirbel (Hist. Nat. Veg., 5 (1803), 86) has only page priority over *Pyrrosia* Mirbel (Hist. Nat. Veg., 5 (1803), 91) which is not recognised by the International Rules of Botanical Nomenclature, and it is felt that there are good arguments for the conservation of *Candollea* Labill. (Stylidiaceae).

Spore dimensions given in this revision are average measurements made on spores mounted directly in Canada Balsam.

KEY TO THE AFRICAN SPECIES OF PYRROSIA

1. Tomentum on the frond composed of stellate hairs of one kind only (uniform) 2
Tomentum on the frond composed of stellate hairs of two kinds (dimorphic) 7. *Stolzii*
2. Stellate hairs on the frond with long, thin brownish arms . . . 3
Stellate hairs on the frond with short, flat white arms . . . 4
3. Rhizome scales dull, ovate-lanceolate, lacinate . . . 1. *africana*
Rhizome scales shining, linear-lanceolate, sub-entire to shortly ciliate 2. *rhodesiana*
4. Rhizome scales ciliate, fronds widely spaced on a long slender rhizome 6. *lanceolata*
Rhizome scales entire 5
5. Fronds linear, 1·5—2·5 mm. broad 5. *Liebuschii*
Fronds linear to lanceolate or oblanceolate, more than 5 mm. broad 6
6. Rhizome scales acuminate, often with a hair-point . . . 3. *Schimperiana*
Rhizome scales rounded or cucullate at the apex.

4. *Schimperiana* var. *Mechowii*

1. *Pyrrrosia africana* (Kunze) Ballard

Pyrrrosia africana (Kunze) Ballard, Kew Bull., 1937, 349 (1937). *Niphobolus africanus* Kunze, Linnaea, 10, 501 (1839); Pappe & Rawson, Syn. Fil. Afr. Austr., 41 (1858); Giesenhagen, *Niphobolus*, 177 (1901); Engler & Prantl, Nat. Pfl., 1, 4, 325 (1902). *Gyrosorium africanum* (Kunze) Presl, Epim. Bot., 140 (1849). *Polypodium africanum* (Kunze) Mett., *Polypodium*, n. 268 (1857) (non Desv., 1827); Kuhn, Fil. Afr., 145 (1868); Hook & Bak., Syn. Fil., ed. ii, 351 (1874); Sim, Ferns S. Afr. ed. i, 203 (1892); Christ, Farnk. d. Erde, 98 (1897). *Cyclophorus africanus* (Kunze) C. Chr., Ind. Fil., 197 (1905); Sim, Ferns S. Afr., ed. ii, 283 (1915).

Rhizome creeping, 3—4 mm. diam., paleaceous, bearing fronds at intervals of 0.2—1.4 cm. Rhizome scales pale brown, dull, ovate-lanceolate, lacinate, up to 8 mm. long and 3 mm. broad. Stipe 0—2.5 cm. long, 2—3 mm. diam., tomentose when young becoming glabrous with age. Frond simple (occasionally bifurcate) lanceolate-acuminate to oblanceolate, tomentose below, more or less glabrous above with age, 5.6—30.0 cm. long, 1.1—3.0 cm. broad, apex acute-acuminate, base narrowly cuneate-decurrent, margin narrowly recurved. Tomentum ferrugineous, composed of uniform stellate hairs whose arms are up to 0.9 mm. long. Hydathodes apparently absent. Dorsal surface of the frond verrucose above ventral soral areas. Sori usually emergent through the tomentum, confined to the upper half of the frond with few exceptions. Spores smooth, $68\ \mu \times 45\ \mu$.

Christensen (1932) was of the opinion that the sori in *P. africana* were confined to the upper third of the lamina. This is true for most of the material examined but in some specimens the soral area extends halfway down the lamina and even farther in a few fronds. The dull, large, lacinate rhizome scales and the narrowly revolute margin of the lamina distinguish it from *P. rhodesiana*, (Fig. 1). Also, the arms of the stellate hairs of the tomentum are shorter and stouter than in *P. rhodesiana* (Fig. 2).

P. africana appears to be confined to the Eastern Cape Province and Natal in the Union of South Africa, where it occurs as an epiphyte. It has been found growing on the trunks of *Encephalartos* in the Eastern Cape Province. Individuals growing in exposed situations produce comparatively small fronds.

TYPE LOCALITY

"In rupium faucibus inter Omtata et Omgaziana," Drège s.n. (Herb. Kunze). The Herbarium of G. Kunze at Leipzig is believed to have been destroyed during the war.

DISTRIBUTION

UNION OF SOUTH AFRICA

CAPE PROVINCE. **East London:** Bonza Bay, *Bottomley s.n.* (PRE);

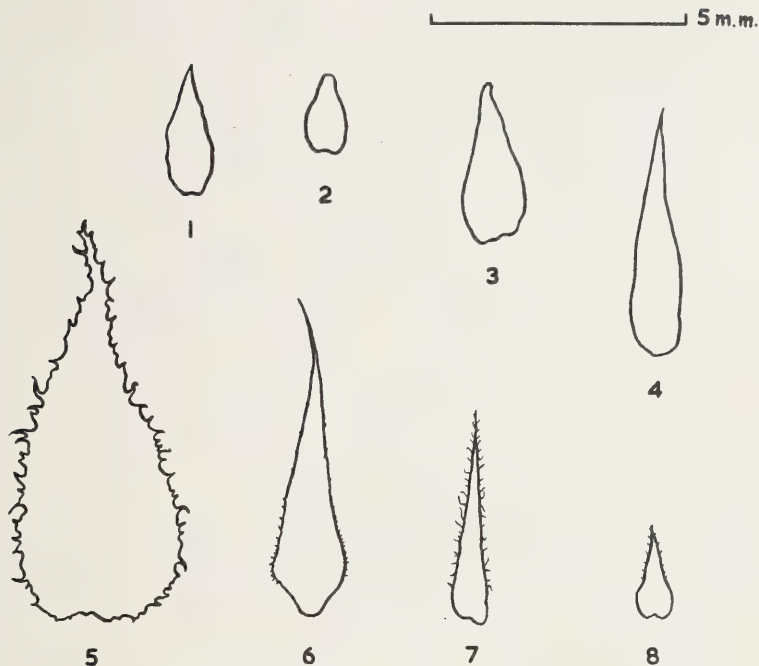


FIG. 1. Outlines of rhizome scales of African species of *Pyrrosia*. 1. *P. Liebuschii* (Peter 7979). 2. *P. Schimperiana* var. *Mechowii* (Eggeling 1473). 3. *P. Schimperiana* var. *Mechowii* (Kassner 2947). 4. *P. Schimperiana* (Schweinfurth 2003). 5. *P. africana* (Drège s.n.). 6. *P. rhodesiana* (Gilliland 2105). 7. *P. lanceolata* (Honey 688). 8. *P. Stolzii* (Stolz 1912).

Cave Rock, *D'Urban s.n.* (K, OXF); East London, *Murray s.n.* (BOL, CTM); Fort Murray, *Mogg s.n.* (PRE); Horseshoe Valley, *C. A. Smith 3818* (PRE); Nahoon River, *Galpin 5601* (PRE); Gonubie Springs, *Acocks 10978* (PRE). **Kentani:** Kentani, *Pegler 303* (PRE). **King Williams Town:** Pirie, *Polls s.n.* (BOL); Yellowwood Falls, *Sim s.n.* (BOL, PRE, TRV). **Komgha:** Komgha, *Flanagan s.n.* (TRV), *Flanagan 830* (PRE). **Port St. Johns:** Port St. Johns, *Alsopp & Brueckner 220* (BM, NU), *Mogg s.n.* (PRE), *Schelte s.n.* (NU), *H. Wager s.n.* (PRE). **Umtata:** Between Umtata and Umgaziana, *Drège s.n.* (BM) (Type collection).

Without locality: *Drège s.n.* (OXF).

NATAL. **Eshowe:** Eshowe, *Rogers 24480* (TRV), *Thode A.12576* (NH, PRE). **Lower Tugela:** Tugela River, *Wood s.n.* (CTM).

Locality unknown: Umgoe Mtns., *Plant* 309 (BM, K). Without locality: *Buchanan s.n.* (NH), *Rawson* 943 (BM).

2. ***Pyrrosia rhodesiana*** (C. Chr.) Schelpe comb. nov.

Cyclophorus rhodesianus C. Chr., Dansk. Bot. Arkiv, 7, 161 (1932); C. Chr., Ind. Fil., Suppl. III, 65 (1934).

Rhizome creeping, $\pm$ 3 mm. diam., paleaceous, bearing fronds at intervals of 0.2–1.5 cm. *Rhizome* scales light brown, shining, lanceolate-subulate, sub-entire above, denticulate below, up to 6 mm. long and 1.5 mm. broad. *Stipe* 1.2–8.0 cm. long, $\pm$ 2 mm. diam., tomentose when young becoming glabrous with age. *Frond* simple (occasionally bifurcate), lanceolate, narrowly elliptical to oblanceolate, tomentose below more or less glabrous above, 6–30 cm. long, 1–3 cm. broad, apex narrowly acute to rounded, base narrowly cuneate, margin plane. Tomentum ferrugineous, composed of uniform stellate hairs whose arms are slender, up to 1.1 mm. long. Hydathodes present, appearing as black sunken spots on the dorsal surface of the frond. *Sori* sunk in the tomentum, usually occurring over the greater part of the frond. *Spores* smooth, $84 \mu \times 54 \mu$.

P. rhodesiana can be distinguished most easily from the related *P. africana* by its shining, lanceolate-subulate rhizome scales. The arms of the stellate hairs of the frond tomentum are longer and more slender than in *P. africana* (Fig. 2).

The species occurs as a saxicole or an epiphyte on tree trunks in forest, and has an East African distribution extending from Southern Rhodesia to Uganda.

TYPE LOCALITY

Southern Rhodesia, Umtali, *Eyles* 4472 at Kew Herbarium.

DISTRIBUTION

SOUTHERN RHODESIA

Chinakwarimba, Vumba Mtns., Umtali, *Chase* 3297 (BM, SAL). Chirinda Forest, *Wild* 2119, 2231 (K), *Swynnerton* 425 (K). Umtali, *Eyles* 4472 (BOL, K, PRE) (Type collection). Vumba Mountains, *Chase* 3102, 3394 (BM), *Fisher* 222 (K, NU), *Fisher* 1138, 1577, 1635a (BM, NU). Ziواني Forest, *Gilliland* 2015 (BM).

PORTUGUESE EAST AFRICA

Garuso, *Fisher & Schweickhardt* 449 (BM, K, NU). "Jaegersberg", Garuso Forest, *Chase* 3296 (BM). Gazaland, Chipete Forest, *Swynnerton* 425a (BM). Gorongoza, *De Carvalho s.n.* (BM). Macequece, *Fisher & Schweickhardt* 449 (BM, K, NU). Manica, Mavita, *Pedro & Pedrogao* 6466 (BM). Montes de Milange, *Torre* 4577 (BM). Zambesi River, *Chase* 3245 (BM).

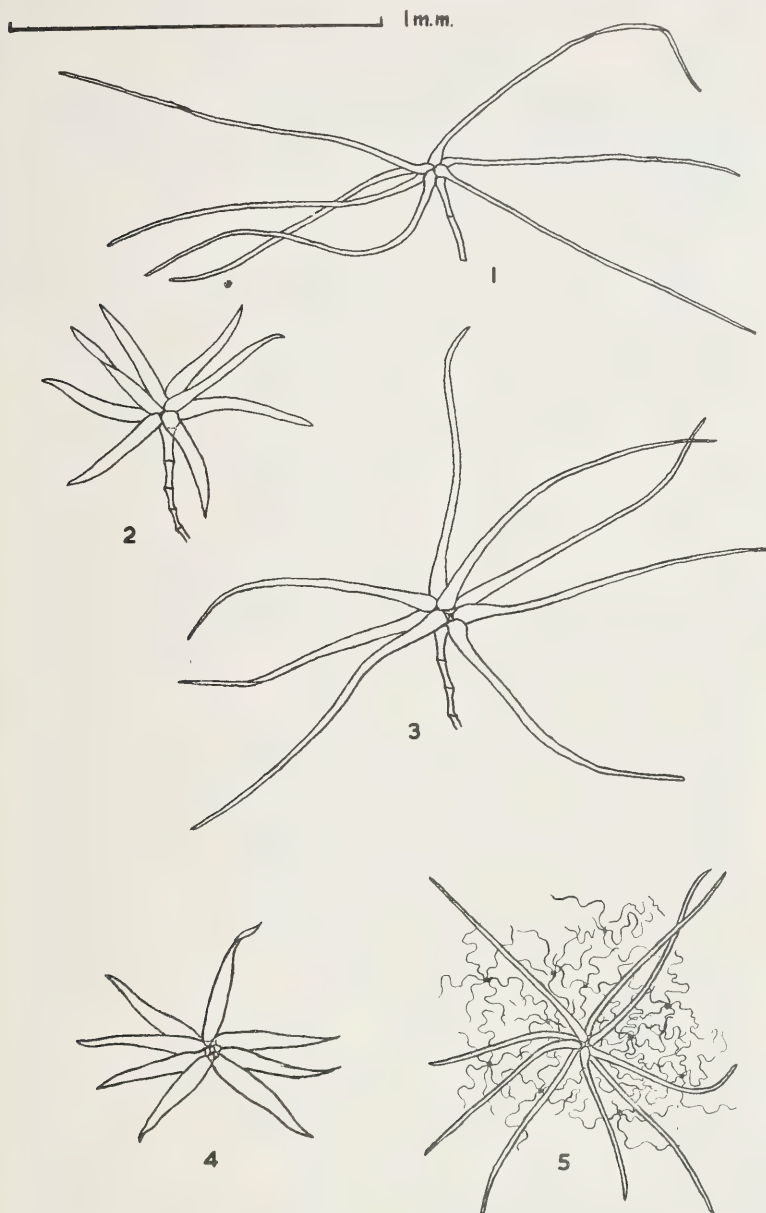


FIG. 2. Frond tomentum hairs of African species of *Pyrrosia*. 1. *P. rhodesiana* (Gilliland 2105). 2. *P. Schimperiana* (Mendonça 3690). 3. *P. africana* (Rawson 943). 4. *P. lanceolata* (Lebrun 987). 5. *P. Stoltzii* (Stolz 1912).

NYASALAND

Near Blantyre, *Last s.n.* (K). Namuli, Makua country, *Last s.n.* (K). Shire, *Scott Elliott* 8523 (BM). Shire Highlands, *Buchanan* 28 (K).

UGANDA

Mt. Elgon, *Snowden* 787 (BM).

3. *Pyrrosia Schimperiana* (Mett.) Alston.

Pyrrosia Schimperiana (Mett.) Alston, Journ. Bot., 72, Suppl. II, 8 (1934). *Polypodium Schimperianum* Mett. ex Kuhn, Fil. Afr., 152 (1868). *Cyclophorus Schimperianus* (Mett.) C. Chr., Ind. Fil., 200 (1905).

Rhizome creeping, 1.5–2.5 mm. diam., paleaceous, bearing fronds at intervals of 1–9 mm. *Rhizome* scales lanceolate, acuminate, often hair-pointed, entire, up to 6 mm. long and 1.1 mm. broad. *Stipe* 0–0.4 cm. long, $\pm$ 2 mm. diam., tomentose when young becoming glabrous with age. *Frond* simple (occasionally 2–4-furcate at apex) linear, lanceolate, elliptic or oblanceolate, tomentose below, more or less glabrous above, 6.7–21.0 cm. long, 0.5–1.2 cm. broad, apex acute to acute-acuminate, base narrowly cuneate-decurrent, margin plane (or frond inrolled). Tomentum grey or greyish brown composed of uniform stellate hairs whose flattened arms are up to 0.35 mm. long. Hydathodes present, appearing as sunken white dots. *Sori* eventually emergent through the tomentum, usually confined to the upper half of the frond. *Spores* smooth, $69 \mu \times 45 \mu$.

Hieronymus (1912) regarded *Cyclophorus Mechowii* as a species distinct from *C. Schimperianus* (Mett.) on the diameter of the rhizome, the shape and structure of the rhizome scales and whether or not the fronds are sessile. In the material examined by the author, the shape of the rhizome scale apices was found to be the only useful character in separating these two "species". Hieronymus appears to have regarded the presence of a distinct velum of hyaline cells around the border of the rhizome scales as a differentiating character of some importance. However, the presence of a distinct velum cannot be correlated with rounded or cucullate rhizome scales alone. Some of the West African material, which can be ascribed to *C. Mechowii* on the character of the rhizome scales having rounded cucullate apices, has an extremely narrow velum e.g. *Mann* 788. On the other hand, some Southern Rhodesian and Mozambique specimens, referred to *C. Schimperianus*, because of the markedly acuminate, often hair-pointed, rhizome scales, exhibit a wide, distinct marginal velum. In one collection, *Pedro* & *Pedro* 6063, some of the rhizome scales have very blunt, widely acute apices although most of the scales are acuminate often ending in a hair. If only equatorial African material is considered the existence of two related "species" is

apparent as it was to Hieronymus. However, the examination of later collections, especially from Southern Rhodesia and Portuguese East Africa has led the present author to the conclusion that these two groups are better treated as a species and a variety.

Pyrrosia Schimperiana is either saxicolous or epiphytic on trees. Judging from the available material, the species as construed here appears to have two separate areas of distribution, one about Abyssinia and Eritrea and another in Southern Rhodesia and Portuguese East Africa.

TYPE LOCALITY

Abyssinia, Dscha-Dsche, *Schimper* 1441. The type specimen is thought to be in Berlin and not available at present. A photograph of this specimen is in the British Museum (Nat. Hist.), London.

DISTRIBUTION

SOUTHERN RHODESIA

Near Salisbury, *Eyles* 8810 (K). Umwindisi R., Enterprise, *Wild* 2007 (BM).

PORTUGUESE EAST AFRICA

Manica e Sofala, Chimoio, Gondola, Nhamoore, *Mendonça* 3690 (BM). Gondola, Amatongas Forest, *Fisher & Schweickerdt* 273 (BM, K, NU). Gondola, *Pedro & Pedrogao* 6063 (BM). Zambesiland, *Kirk s.n.* (K).

ERITREA

Ghinda, Embatkalla, *Schweinfurth* 2003 (K).

4. *Pyrrosia Schimperiana* (Mett.) var. *Mechowii* (Hieron.) Schelpe comb. nov.

Cyclophorus Mechowii Hieron., Engl. Jahrb., 46, 395 (1911); C. Chr., Ind. Fil., Suppl. I, 22 (1913) (*Niphobolus Mechowii* Brause & Hieron. (nomen), Veg. d. Erde, 9, Pflanzenwelt Afrikas, 2, i, 55 (1908).). *Niphobolus Schimperianus* Giesenhagen (non *Polypodium* Mett. 1868), *Niphobolus*, 112 (1901).

Rhizome creeping, 1.5–2.5 mm. diam., paleaceous, bearing fronds at intervals of 0.1–1.2 mm. Rhizome scales ovate to ovate-lanceolate, entire, apex rounded often cucullate, up to 3.2 mm. long and 1.2 mm. broad. *Stipe* 0.1–2.8 cm. long, $\pm$ 2 cm. diam., tomentose when young becoming glabrous with age. *Frond* simple, linear to oblanceolate, tomentose below, more or less glabrous above, 6.2–33.6 cm. long, 0.8–2.3 cm. broad, apex widely acute to acute-acuminate, base narrowly cuneate-decurrent, margin plane (or leaf inrolled). Tomentum grey or greyish-brown composed of uniform stellate hairs whose flattened arms are up to 0.34 mm. long. Hydathodes present, appearing as white dots on the dorsal surface. *Sori* emergent through the tomentum, usually confined to the upper half of the frond. *Spores* smooth, $66 \mu \times 39 \mu$.

The variety *Mechowii* is distinguished by its rhizome scales which are rounded, often cucullate, at the apex. The spores of the variety are somewhat smaller on the average than in *P. Schimperiana*, but an overlap of spore dimensions does occur.

This variety is saxicolous or epiphytic and has a known distribution across Central Africa stretching from Nigeria in the west to Kenya in the east and to Northern Rhodesia and Nyasaland in the south.

TYPE LOCALITY

Cameroons, Ambas Bay, *Mann* 788. The type specimen is thought to be at Berlin; specimens of the type collection are at Kew and the British Museum (Nat. Hist.), London.

DISTRIBUTION

PORTUGUESE EAST AFRICA

Niassa prov., Monte Massangulo, *Gomes e Sousa* 1283 (BM, K)

NYASALAND

Namuli, Makua country, *Last s.n.* (K). Shire Highlands, near Blantyre, *Last s.n.* (K).

ANGOLA

Angola, *Gossweiler s.n.* (BM). Malange, Cataracta Duque de Bragança, *Carisso & Mendonça* 69 (BM). Pundo Andongo, *Welwitsch* 152 (BM).

Soba Quijima, forte Uije, *Gossweiler* 7362 (BM).

NORTHERN RHODESIA

Kasomo, nr. Lake Bangweolo, *Fries* 804 (BM). Mwinilunga district, *Milne Redhead* 3437 (BM, K).

TANGANYIKA

Kasulu, *Tawney* 9855 (K). Kyimbila, *Stolz* 547 (K).

BELGIAN CONGO

Kisungu, *Callens* 2645 (K). Trumu, *Bequaert* 4881 (BR). Lukapu, *Kassner* 2644 (BM). Mt. Morumbe, *Kassner* 2947 (BM, K).

CAMEROONS

Ambas Bay, *Mann* 788 (K). Station Johann-Albrechtshöhe, *Staudt* 475 (BM, K).

NIGERIA

Wana, Mada Hills, *Hepburn* 95 (K).

UGANDA

Budongo, *Eggeling* 2117 (BM), *Eggeling* 2024 (K). Budongo Forest, *Eggeling* 1559 (K), *Sangster* 125 (BM). Sonso R., Budongo, *Eggeling* 2295 (BM). Budamu, Tororo, *Maitland* 1312 (K) Bunyanguru, Ankole, *Purseglove* 843 (K). Bungayabo, Toro, *Snowden* 98 (BM, K) (juvenile). Bunyoro, *Sangster* 166 (BM). Elgon district, *James s.n.* (K). Mt. Elgon, *Snowden* 788 (BM, K), *Snowden* 789 (K). Fort Portal, Nyakasura School, *Thompson* 73 (BM).

SUDAN

Lado, Yei River, *Sillitoe* 115 (K).

KENYA

Sotik district, Chepalungu Forest, *Gardner* 2537 (K).

5. *Pyrrosia Liebuschii* (Hieron.) Schelpe comb. nov.

Cyclophorus Liebuschii Hieron., Engl. Jahrb., 46, 398 (1911); C. Chr., Ind. Fil., Suppl. I, 22 (1913).

Rhizome creeping, 1 mm. diam., paleaceous, bearing fronds at intervals of 2–4 mm. *Rhizome* scales ovate lanceolate, entire, with a marginal velum, apex acute-acuminate, up to 2.6 mm. long and 1.0 mm. broad. *Stipe* 1–5 mm. long, $\pm$ 0.8 mm. diam., more or less tomentose when young, becoming glabrous with age. *Frond* simple, linear, often terete by inrolling of the margins, tomentose below, more or less glabrous above, 2.0–15.4 cm. long, 0.15–0.25 cm. broad, apex acute, base narrowly decurrent-cuneate, margin plane (or frond inrolled). Tomentum grey composed of uniform stellate hairs whose arms are short and flattened. Hydathodes present, appearing as white dots along the margin of the dorsal surface of the frond. *Sori* emergent through the tomentum at maturity, usually confined to the upper two-thirds of the frond. *Spores* smooth $65 \mu \times 42 \mu$.

P. Liebuschii is distinct among the African species of *Pyrrosia* with its small narrowly linear fronds. It occurs amongst mosses on rocks and on tree-trunks in the Usambara Mountains in Tanganyika where it appears to be endemic.

TYPE LOCALITY

Tanganyika, Usambara, near Lutindi, *Liebusch s.n.* The type specimen is thought to be at Berlin and not available at present.

DISTRIBUTION

TANGANYIKA

Amani, *Braun* 736 (K), *Glynne* 244 (K), *Greenway* 1031 (BM, K), *Verdcourt* 148 (BM). Amani, Sigi Valley, *Greenway* 1755 (K), *Braun* 780 (BM). Sigi Valley, Kwamkuja Falls, *Braun* 736 (BM). Amani, *Warnecke* 328 (BM, K). East Usambara, Kwamkuyu Valley, *Peter* 7979 (BM, K). East Usambara, *Peter* 16845, 19887 (K).

6. *Pyrrosia lanceolata* (L.) Farwell

Pyrrosia lanceolata (L.) Farwell, Amer. Midl. Nat., 12, 245 (1931); Ching, Bull. Chin. Bot. Soc., 1, 70 (1935). *Acrostichum lanceolatum* L., Sp. Pl., 1067 (1753). *Candollea lanceolata* (L.) Mirb. in Lamk. & Mirb., Hist. Nat. Veg., 5, 89 (1803). *Polypodium spissum* Bory ex Willd., Sp. Pl., 5, 246 (1810). *Cyclophorus spissus* Desv., Berl. Mag., 5, 301 (1811); C. Chr., Ind. Fil., 201 (1905) cum syn. *Nipholobolus spissus* (Bory

ex Willd.) Kaulf., Enum. Fil., 126 (1824); Giesenhagen, *Niphobolus*, 204 (1901). *Polypodium pertusum* Hook., Exot. Fl., 2, t. 162 (1825) (partim). *Polypodium vittarioides* Wall., (nomen) List, n. 270 (1828); Mett., *Polypodium* n. 256 (1857). *Niphobolus vittarioides* (Wall. ex Mett.) Pr., Tent., 202 (1836); Engler & Prantl, Nat. Pfl., 1, 4, 325 (1902). *Cyclophorus vittarioides* (Wall. ex Mett.) Pr., Epim. Bot., 129 (1849). *Niphobolus fissus* Bedd., Ferns S. Ind., t. 184 (1864) (non Bl.). *Polypodium adnascens* pt. auctt., Hook & Bak., Syn. Fil., 349 (1867); Clarke, Trans. Linn. Soc., II, Bot., 1, 552 (1880). *Niphobolus adnascens* Bedd., Handb., 325 (1883) (non Spr.). *Niphobolus lanceolatus* (L.) Trim., Journ. Linn. Soc. (bot.), 24, 152 (1886). *Niphobolus Giesenhagenii* Christ, Ann. Cons. Jard. Bot. Geneve, 7—8, 330 (1905). *Cyclophorus Giesenhagenii* (Christ) C. Chr., Ind. Fil., 199 (1905). *Cyclophorus spissus* (Bory) Desv. var. *continentalis* Hieron., Engl. Jahrb., 46, 399 (1911). *Cyclophorus lanceolatus* (L.) Alston, Journ. Bot., 1931, 102 (1931); C. Chr., Ind. Fil., Suppl. III, 65, (1943).

Rhizome widely creeping, 1.0—1.5 mm. diam., paleaceous, bearing fronds at intervals of 1.0—3.0 cm. Rhizome scales pale brown to grey, linear-lanceolate, ciliate, up to 4 mm. long and 0.8 mm. broad. *Stipe* 0.1—1.8 cm. long, 1 mm. diam., tomentose when young becoming glabrous with age. *Frond* simple, linear to lanceolate or narrowly elliptical, appressed-tomentose below, more or less glabrous above, 3.5—16.4 cm. long, 0.5—1.5 cm. broad, apex narrowly acute to rounded, base cuneate, margin usually narrowly reflexed. Tomentum pale brown or grey, composed of uniform stellate hairs with short flattened arms. Hydathodes apparently absent. *Sori* emergent through the tomentum, confined to the upper half of the frond. *Spores* verrucose, $72\ \mu \times 39\ \mu$.

P. lanceolata is easily distinguished from the other continental African species by its widely creeping slender rhizomes clothed in lanceolate ciliate scales. Hieronymus (1912) segregated the African specimens under the variety *continentalis* on the grounds that the rhizome scales were more longly ciliate than in the type. These cilia vary considerably in length (10—54 μ) and consequently his variety is not recognised here.

Besides having a wide distribution in continental Africa, this epiphytic species also occurs in Madagascar, Ceylon, India and China. The Bourbon plant of this species group, segregated under *Cyclophorus tener* (Fée) C. Chr., may be distinct, but an inadequate range of material prevents any definite conclusions.

TYPE LOCALITY

"Habitat in India" (Ceylon). The type specimen is in Hermann's herbarium (I. folio 3) in the British Museum (Nat. Hist.), London. Another specimen is in the Linnean Herbarium apparently acquired after the publication of the "Species Plantarum".

DISTRIBUTION

PORTUGUESE EAST AFRICA

Manica e Sofala, Cheringoma, Serraço de Durundi, *Torre* 4189a (BM). Mile 10½, Trans-Zambesi Railway, *Honey* 688 (K).

TANGANYIKA

Amani, *Glynne* 238 (K), *Greenway* 756 (K), *Warnecke* 317 (BM). Amani, Sigi Sangali, *Verdcourt* 149 (BM). Sigi to Longusa, *Peter* 24633a (BM). Morogoro, *Leroy* 605 (K).

BELGIAN CONGO

Wendje, environs de Coquilhatville, *Lebrun* 987 (BM, BR).

CAMEROONS

Barombi, *Preuss* 284 (BM). Tiko, *Dunlap* 179, 243 (K).

PRINCIPE

Principe, *Quintas* 30 (BM).

UGANDA

Kipayo, *Dümmer* 788 (BM).

7. *Pyrrosia Stolzii* (Hieron.) Schelpe comb. nov.

Cyclophorus Stolzii Hieron., Engl. Jahrb., 46, 396 (1911) errore *Stoltzii*. *Niphobolus Stolzii* Hieron. Veg. d. Erde, 9, Pflanzenwelt Afrikas, 2, 1, 55 (1908) errore *Stoltzii*.

Rhizome creeping, 1.5 mm. diam., paleaceous, bearing fronds at intervals of 1 cm. *Rhizome* scales brown, dull, lanceolate, sub-entire below, ciliate above, up to 1.9 mm. long and 0.6 mm. broad. *Stipe* 5.1—9.5 cm. long, 1—1.5 mm. diam., tomentose when young, becoming glabrous with age. *Frond* simple, lanceolate, oblanceolate or elliptical, tomentose below, glabrescent above, 12.8—25.2 cm. long, 1.5—3.2 cm. broad, apex acute, base narrowly cuneate-decurrent, margin plane. Tomentum grey, composed of two kinds of stellate hairs, the larger stellate hairs with fairly straight slender arms up to 0.7 mm. long standing above more numerous smaller whitish hairs with twisted and matted arms. Hydathodes present, appearing as whitish spots on the dorsal surface of the frond. *Sori* emergent through the tomentum at maturity, occurring over the whole or only over the upper part of the frond. *Spores* smooth, $78 \mu \times 46 \mu$.

P. Stolzii is the only known continental African *Pyrrosia* with dimorphic stellate hairs in the frond tomentum. *Pyrrosia madagascariensis** (C. Chr.) Schelpe comb. nov., a Madagascar species with dimorphic hairs in the tomentum can be distinguished from *P. Stolzii* in that it has subulate, shining brown rhizome scales up to 5 mm. long. Also the tomentum of *P. madagascariensis* has a ferrugineous colour, not whitish as in *P. Stolzii*.

* *Cyclophorus madagascariensis* C. Chr. in Dansk. Bot. Ark. 7, 161 (1932)

This epiphytic species is only known from two localities in the Nyassa district of Southern Tanganyika.

TYPE LOCALITY

Tanganyika, "Nyassa-gebiet, Kondeland", near Lungwe, 1450 m. *Stolz* 96. The type is thought to be at Berlin and not available at present. A photograph of the type specimen is in the British Museum (Nat. Hist.), London.

DISTRIBUTION

TANGANYIKA

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HERBARIUM ABBREVIATIONS

Lanjouw (1932) in *Chronica Botanica*, 5 2/3, has been followed in the choice of herbarium abbreviations.

BM	British Museum (Nat. Hist.), London.
BOL	Bolus Herbarium, University of Cape Town, Cape Town.
BR	Jardin Botanique de l'État, Brussels.
CTM	South African Museum, Cape Town.
K	Royal Botanic Gardens, Kew.
NH	Natal Herbarium, Durban.
NU	Dept. of Botany, University of Natal, Pietermaritzburg.
OXF	Fielding Herbarium, University of Oxford, Oxford.
PRE	National Herbarium, Pretoria.
TRV	Transvaal Museum, Pretoria.

PRINCIPAL REFERENCES.

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|-----------------|--|
| CHRISTENSEN, C. | (1905) Index Filicum. Hafniae (and supplements).
(1932) Pteridophyta of Madagascar. Dansk. Bot. Arkiv, 7. |
| COPELAND, E. B. | (1947) Genera Filicum. Waltham, Mass. |
| HIERONYMUS, G. | (1911) Polypodiacearum species novae vel non satis cognitae africanae. Engl. Jahrb., 46, 345—404. |